The Development of 3d Printing Technology Combined with Traditional Patterns

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Abstract: With the continuous progress of the times and the continuous development of technology, a new type of technology-3D printing technology has been continuously improved. 3D printing technology is a technology in which people draw models of desired objects and products in a computer, and then use 3D printers to combine plastic materials to accumulate into layers one by one. It is often used in the manufacture of products, especially some high-value products, such as aircraft parts. The pattern is an important component of traditional Chinese culture, which runs through China's historical development and people's lives, and reflects the changing development of the times, customs and so on. The combination of the two has played a huge role in restoring the past and transmitting the future.

1. Introduction

Traditional patterns, from simple patterns in primitive society to simple bronze patterns in slave society, to exquisite and complex flowers, birds, insects and fish in feudal society, flying birds and beasts all exemplify the progress and development of society, showing historical changes and national customs.

The patterns in primitive society are mainly divided into two categories: geometric patterns and natural patterns. Next is the decorative pattern of Banpo type (Figure 1) divided into decorative patterns and fish patterns. Among them, the decorative patterns are vivid and lively due to the influence of the temple ditches; the fish patterns occupy most of the animal patterns of the Banpo type, and they run throughout. The patterns of the Miaodigou type are dominated by colored pottery, and the main patterns are bird patterns (Figure 2). The pattern of Majiayao is mainly frog pattern (Figure 3).

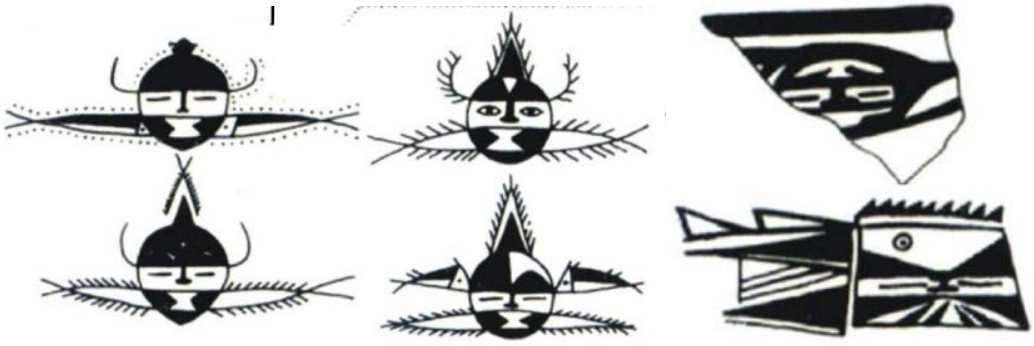

Fig.1 Decorative Pattern of Banpo Type

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Fig.2 The Bird Patterns

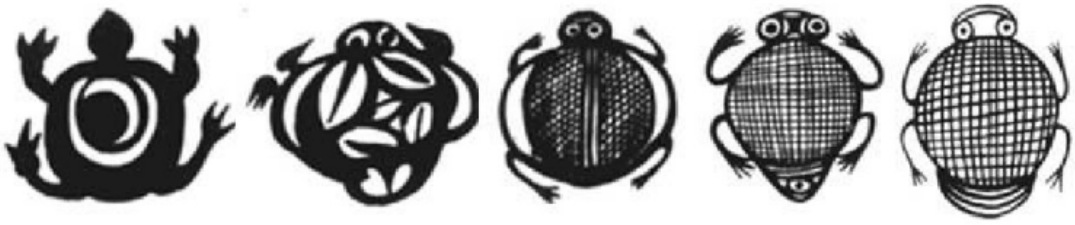

Fig.3 The Frog Pattern

The patterns of the Shang Dynasty were mainly bronze; the porcelain of the Northern Qi Dynasty was dominated by lotus petals; the patterns of the Tang Dynasty were mostly flowers, birds, insects, fish, dragons, phoenixes, and flow clouds; Peony and lotus, etc.; there are eight immortals in the Ming Dynasty, story and drama patterns (this pattern has been extended to the Qing Dynasty), and porcelain are fish and water patterns. The patterns of porcelain in the Qing Dynasty were mainly blue and white gourd patterns and banana leaf patterns, which combined a large number of different developments at home and abroad.

First, it is made through the crystallization of the wisdom of the working people and hard-working hands, such as paper cutting, window grilles and so on. It can well reflect the results of the combination of traditional Chinese patterns and culture from the side. Second, it is also a combination of local religious beliefs. Through various legends and myths, the most famous is the Dunhuang Mogao Grottoes. Thousands of murals on it are the embodiment of this combination of civilizations. Third, it is all kinds of cultural relics. Ancient people and the utensils owned by the rulers can understand the development and progress of history in terms of the patterns of utensils used.

2. Second, the Help of Computers in Traditional Patterns

2.1 Introduction of 3d Printing Technology

3D printing technology was born in the late 1980s, the main operation is to accumulate the products of the stackable plastic metal or plastic, and the mathematical model verification of the 3D printing digital material calculation printer. And used in some products for direct manufacturing, in the aircraft parts, teeth and other applications, 3D printing technology has been greatly popularized.

In terms of sales volume and output, it has gradually increased since the 21st century and prices have fallen. People mainly use it to make clothing, building models, cars, chocolate desserts, etc. The advantage of 3D printing technology is that it does not require any mechanical equipment processing, but is directly generated from the data of the computer, which greatly reduces the production time and development cycle, greatly improves productivity, and reduces costs. Unlike traditional technologies, 3D printing reduces costs by discarding production lines, reduces material waste, and can produce shapes that do not exist in traditional technologies. And because the raw materials are only needed for production, the parts produced are very light and very strong.

2.2 The Help of 3d Printing Technology in Traditional Patterns

With the development and progress of new technologies, 3D printing has achieved excellent results in many fields. In 2014, Zhang Xiaoqing published an evaluation of 3D technology in an article, which mainly expressed the implementability of 3D technology in the restoration of cultural relics, and played a very important role in the development of traditional patterns. Through the mathematical model construction technology of the computer, various patterns in the cultural relics are repaired conveniently and quickly, and some invisible patterns are speculatively repaired. In 2016, Jiang Daoyin, Cai Yiting and Zhou Kaihua published an article in the magazine “Relics Restoration and Research”. Through the explanation of the repair process of damaged cultural relics, the huge role of 3D printing technology in the reproduction and repair of cultural relics is explained in detail. This has greatly inspired the development of traditional patterns with historical significance.

With the progress of the times, people have entered a fast-paced life. It is difficult for most people to calm down and study to make an appliance. They gradually lag behind in the development of porcelain, and the traditional patterns of China are slowly lost. . The 3D printing technology that emerged at this time saved this crisis. Different from the traditional production method, it is only necessary to draw the composition in the computer, and it is faster and easier to use the intelligent method.

3. The Combination of 3d Printing Technology and Traditional Patterns

Mechanism	Year	Prediction
2014 Wals Report	2020	The global 3D printing industry reaches USD 21 billion
Gartner	2015-2018	The global 3D printer market will increase from $1.6 billion to $13.4 billion
AMR, United Market Research Institute	2020	The global 3D printer market will increase to 8.6 billion US dollars
Siemens	2023	The global 3D printer scale will reach 8.3 billion US dollars

3.0.1 3D Printing Technology Auxiliary Pattern

The substantial development of 3D printing technology has a huge effect on repairing traditional Chinese patterns. Most of the ordinary traditional patterns are made by hand. With the passage of time, many cracks or unclear patterns are produced on the surface. Direct repair will bring a huge workload and cause a lot of repair personnel. Pressure, and it is difficult to produce fresh patterns. The 3D printing technology provides a better method. That is, using computer technology to build a model using three-dimensional software modeling, using a 3D printer, using Hips and other soluble printing materials to print it out, according to the actual size of the model and printing accuracy, the time varies.

3.1 Computer Graphics Auxiliary Pattern

The drawing of porcelain patterns is too complicated, especially the various daily necessities used by nobles in the ancient palace. The pattern is not only complicated but there are no examples that can be borrowed. If a part of it is damaged, it will be difficult to repair. Even if you don’t pay attention to it during repair, it may make you lose your previous efforts, which will take a lot of time. But with modern digital image processing technology can solve this problem. Use artificial intelligence to speculate on patterns or design patterns we need. The patterns drawn by computer are not only quick to form and easy to modify, but also have great advantages in batches. They can also be converted into various formats and imported into different machines for large-scale Yield production.

3.2 Actual Production and Application

Lacquer carving is mainly used in the decoration of some Buddha statues in southern Fujian, which is a traditional handicraft here. Through exquisite workmanship and elaborate production methods, it is not only famous in China, but also little known abroad. There are many religions in Quanzhou area, there are many large and small ancestral temples, the most famous lacquer carving

is from here. Lacquer carvings are mostly used on reliefs, and many artists of lacquer carvings have a lot of space for exhibition here. Most of the lacquer carvings sold on the market come from here, and they are the fine works of Han folk art with a long history in Quanzhou.

The traditional lacquer carving method is complicated and requires a lot of effort. Although it is not so exaggerated for lacquer carving artists to make a lacquer carving, it has a fatal flaw-it is time. Although it is not wrong to just make by the old methods, but blindly immersed in the past can not have innovation. Therefore, the combination of 3D printing technology no longer makes paint line carving artists focus on only one work, leaving more time for the brain to have more thinking time, and innovating and creating more beautiful artworks.

This is a very energy-consuming thing, and as mentioned before, an inattention will cause errors. With the development of science and technology, the artistic production of lacquer thread carvings must also advance with the times. Combined with 3D printing technology, it saves the time and energy of lacquer line carving artists, allowing them to invest in the innovation of lacquer line carving to produce more exquisite works of art.

It is very convenient to use the 3D printing technology. First, the required parts are scanned first, and then the three-dimensional computer software is used for modeling, and then the built mold is printed with a 3D printer. Completely liberated the time of lacquer carving artists.

In addition, it also has an advantage in the repair of some cultural relics. It allows 3D printing and artificial intelligence to be combined to predict patterns through comparison, making it easier for cultural remediation personnel.

4. Conclusion

The maturity of 3D printing technology has brought great convenience to people's lives. An object can be created directly through computer graphics and data settings. For people with artistic talents, 3D printing is nothing more than a faster and more convenient way. Although the 3D printing technology is not mature enough, it may even cause inconvenience due to the size of the shape produced, but this cannot prevent the rise of 3D printing technology. There must be very good development in the future.

The development of traditional patterns in my country has not been lost because of history, and it is still developing. It is rich in culture and aesthetics, but in this era of always changing aesthetics, my country's development inheritance is greater than innovation and lacks innovation. Therefore, for the continuous development of traditional patterns, we must innovate with contemporary art design methods and adopt contemporary technology. If you use 3D greater than technology, it can be completed and mass-produced only through a computer.

Although 3D printing, 4D printing, and electroencephalogram printing currently have their corresponding limitations, new materials are released every year. With the development of technology, new materials, new processes, new applications, etc., I believe that in the near future, 3D printing will reach a new height, opening a new chapter in 3D printing.

This article introduces the traditional Chinese patterns first, and then introduces the 3D printing technology with examples. my country's traditional patterns are lack of innovation because of the existence of traditions, the same cultural connotation of products, and lack of emotional expression. With the traditional culture of our country combined with contemporary aesthetics, the use of 3D printing technology to achieve the purpose of implementation. Only by taking traditional patterns based on Chinese culture, using contemporary design, and making with advanced technology can we achieve true inheritance, innovation, and development.

Acknowledgment

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